UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

August 26, 2020 LR-16J

VIA ELECTRONIC MAIL

Mr. Cary Mathias
Regional Waste Manager
ArcelorMittal USA
4020 Kinross Lakes Parkway
Richfield, OH 44286-9000

RE: Review of Remedial Study Report – Former Coke Plant
Tecumseh Redevelopment, Inc.
ArcelorMittal USA LLC – Indiana Harbor West
EPA ID No. IND 005 462 601

Dear Mr. Mathias

The U.S. Environmental Protection Agency has reviewed the April 17, 2020 *Remedial Study Report for Former Coke Plant* Area (Report) submitted to EPA by ArcelorMittal, USA. EPA's review focused on technical consistency and adherence to policy and regulations. Comments on the Report are enclosed. EPA requests that ArcelorMittal review the comments and provide a response along with a revised Report within 45 days from the date of this letter.

If you have any questions about this letter, please contact me at (312) 353-9229 or pursel.brandon@epa.gov.

Sincerely,

Digitally signed by BRANDON PURSEL
Date: 2020.08.26 16:57:50 -05'00'

Brandon Pursel
Project Manager, Corrective Action Section 3
Land, Chemicals & Redevelopment Division

Enclosure

cc: John Hill (ArcelorMittal)

EPA TECHNICAL REVIEW
REMEDIAL STUDY REPORT – FORMER COKE PLANT
ARCELOR MITTAL INDIANA HARBOR WEST – EAST CHICAGO, INDIANA

ArcelorMittal submitted the *Remedial Study Report - Former Coke Plant Area* dated February 6, 2020 for the ArcelorMittal Indiana Harbor West facility located in East Chicago, Indiana. EPA provided comments on that submittal on March 6, 2020, which this April 17, 2020 submittal addresses. The Report responds to those comments and includes revisions that summarize the methodologies used to evaluate remedial technologies to be used to address LNAPL and LNAPL-related groundwater contamination at the Former Coke Plant. EPA requested the Report as part of the site-wide strategy to address contamination as a result of historic operations at facility.

GENERAL COMMENTS

General Comment 1: The response to comments included in the Report appear to be largely acceptable, however the issue of groundwater discharge into surface water remains. ArcelorMittal refers to the results of modeling efforts to calculate surface water concentrations from groundwater concentrations with a dilution attenuation factor to estimate risks. The Indiana state rules pertaining to surface water quality standards do not allow for dilution regardless of the rate of mixing. For short-term cleanup goals, utilizing these factors may be an appropriate tool for designing a cleanup strategy and evaluating the technical practicability of several technologies, however long-term goals must satisfy these requirements. This is consistent with *Handbook of Groundwater Protection and Cleanup Policies for RCRA Corrective Action* (EPA, 2004), and is necessary to understand in order to establish groundwater monitoring schedules, long-term stewardship goals and achieve the metrics identified in Environmental Indicator (EI) CA750.

General Comment 2: The Report places emphasis on a 7-year monitoring period for the corrective measures, which ArcelorMittal believes is "a reasonable time frame that may be necessary to demonstrate stable or decreasing volatile organic compound (VOC) concentrations in groundwater site-wide." EPA does not agree that placing timeframes on monitoring periods without additional metrics and measures pertaining to groundwater conditions is appropriate. Instead, EPA believes it is preferable to discuss the duration of the groundwater monitoring program in terms of contaminant concentration targets rather than a set number of years. The Report should rely on quantitative metrics and decision endpoints when determining monitoring periods or schedules. Examples of metrics may include statistical evaluations or other metrics that measures LNAPL behavior, geochemistry or physical properties. The Report should be revised to include a performance-based approach rather than a time-based approach for each technology evaluated.

General Comment 3: Groundwater monitoring is expected to be a component for each technology that was evaluated, and the Report states that monitoring will begin following the completion of each active remedy's implementation. Considering that time frames vary with each active remedy, the Report should include additional detail on when the monitoring period would begin with each technology. The cost tables should reflect this information as well in the event this revision causes the overall estimate to change.

General Comment 4: The Report contains inconsistencies regarding the balancing and threshold criteria, namely how they are used in evaluating each technology and how much weight was given to each

criterion for the applicable technology. The comparative analysis summarized in Section 7 and Table 7-1 should be revised to ensure each technology is evaluated evenly against the threshold and balancing criteria. Presently, it would appear the analysis was performed with a bias in favor surfactant enhanced recovery (SER).

General Comment 5: The Report should include draft institutional control language to facilitate expedited implementation of groundwater use restrictions and deed restrictions.

General Comment 6: EPA reiterates the need for an adaptive approach to remedy implementation, that is, recognizing the need for additional treatment options should asymptotic conditions arise prior to corrective measures objectives (CMOs) being met within the point of compliance. EPA acknowledges the confidence expressed by ArcelorMittal regarding the likelihood of success with SER at the Former Coke Plant as well as the possible need for additional remediation should sentinel wells along the Indiana Harbor Shipping Canal indicate a need. EPA may also request additional measures be taken if wells within the greater area of contamination do not suggest CMOs or other threshold criteria will be met with SER alone.

SPECIFIC COMMENTS

Section 2: Description of Current Conditions

1. *Section 2.5.3, Page 15*: A list of contaminants of concern was provided that includes arsenic but differentiates background concentrations and site activity. The Report notes that higher concentrations in the deeper zones are attributable to reducing conditions but makes little mention of concentrations in the shallower depths. Expand this section to discuss if shallow groundwater concentrations can be attributed to background concentrations or site activity. Additionally, expand this section to reflect that arsenic was carried over into risk assessments and in the Report and clarify if those concentrations reflect shallow or deeper zones.

Section 5: Identification and Screening of Corrective Measures Technologies

2. *Section 5.3, Page 25*: The Report says hydraulic containment will be used; however, containment usually is used to describe enclosures or some other technique to keep contamination migrating in an uncontrolled manner from a defined source area. Considering the approach relies on extraction of groundwater, the Report should be revised in this section and elsewhere to reflect this.

Section 6: Evaluation of Corrective Measures Alternatives

3. *Section 6.1.2.5*: The Report states in Section 4, page 23 under the Corrective Measures Objectives section that financial assurance will be used to ensure future obligations, including operations and maintenance of active remedies and other mechanisms, can continue. The Section 6.1.2.5 should be expanded to state what mechanism(s) are being considered for financial assurance.

4. *Section 6.1.2.5*: This section discusses groundwater monitoring as a common component of all active corrective measures technologies; however, the text suggests it serves as a distinct and separate technology. Revise this section to reflect the role that groundwater monitoring will play during and after remedy implementation.

5. *Section 6.2 through 6.4*: This section appears to be largely focused on LNAPL source zone treatment, whereas each technology will likely have an effect on soil contamination, dissolved-phase groundwater contamination and source mass. These sections should include each technology's ability to address contaminants in these media, while also noting the risks of enhanced mobility with a potential effect of increasing the contamination footprint.

6. *Section 7*: Section 7 discusses drawbacks regarding factors that apply to in-situ chemical oxidation (ISCO), but not SER despite these factors being important for both technologies. In particular, good contact between the surfactant or oxidant and the LNAPL or residual LNAPL is necessary for both technologies and in both cases is facilitated by favorable permeability and homogeneity in the subsurface. Despite these factors being relevant for both SER and ISCO, this section states that low permeability matrices and oxidation being limited to the surface of the NAPL is only a drawback for ISCO. It is unclear why the factors would not be a drawback for both technologies.

Section 7: Comparative Evaluation of Corrective Measures

7. *Section 7*: This section states that in-situ thermal reduction (ISTR) will not likely remove all contaminant mass, leaving a small fraction in the subsurface after treatment. While the goal of all remedies is to remove all contamination so that soil and groundwater is completely restored to its maximum beneficial use, it is understood that active remedies will likely leave some mass untreated regardless of the technology, especially in scenarios where contaminant concentrations are significantly above all local, state or federal criteria. The Report does not provide an estimated percent mass removal for SER and ISCO, although it is believed those technologies are also likely to leave some fraction of contaminant mass behind following treatment. The Report estimates that more than 99% of the contaminant mass may be removed with ISTR, suggesting this technology could be highly ranked depending on how much mass removal is expected with ISCO or SER. The discussion should be expanded to include a more balanced evaluation of the expected performance of each technology.

8. *Section 7*: The section notes the costs for each technology is high, however there is no justification for stating the cheapest option is also high in the context of cost comparisons. Furthermore, each estimate is well within an order of magnitude from one another, suggesting that cost differences do not vary substantially. For these reasons, cost differences should not play a significant role in remedy selection compared to the other balancing criteria.

9. *Section 7*: This section largely overlooks Table 7-1, that is, benefits and detriments associated with each technology are not consistently discussed. For example, both ISCO and ISTR can treat LNAPL and dissolved-phase constituents, however this section does not draw attention to this benefit for both technologies. This is material considering that SER intentionally increases the mobility of LNAPL and dissolved-phase VOCs to facilitate extraction. Additionally, Table 7-1 notes that ex-situ treatment is necessary for ISTR making the technology not favorable, however SER also requires ex-situ treatment or disposal whereas ISCO does not. Finally, both this section and Table 7-1 should reflect the necessity for multiple injections with ISCO and SER, as well as the longer time period needed for ISTR to reach maximum efficacy. This section and Table 7-1 should be expanded to include these comparisons and more accurately reflect one another so they evaluation is balanced.

10. *Section 7.1*: Green remediation is discussed as a benefit for SER, however, does not appear to have

been a factor in evaluating the other technologies. This section and Table 7-1 should up be expanded to include this factor in the implementability row.

11. *Section 7.3*: Community acceptance of SER is noted as an important factor due to its implementation not resulting in off-site impacts, additional traffic, or other impacts to workers or the community. These benefits are also applicable to ISTR and ISCO as well, therefore this does not appear to be a distinguishing factor over the other technologies.

Tables and Appendices

12. *Table 4-1*: This table appears to be intended for discussion pertaining to CMOs and performance metrics, however is limited only to SER. In order to support a final decision, this table should also include ISCO and ISTR's ability to meet CMOs with relevant metrics associated with each technology. Presently, this table is not useful for evaluating the technical practicability of each technology. The table title should also be revised to reflect performance metrics without a reference to any one particular technology.

13. *Appendix B: Costs*: The cost estimate should include a more detailed estimate regarding assumptions that were made in estimating the costs for each technology. Examples include but are not limited to the number of extraction wells, volume or mass of surfactant or oxidants and total solution to be injected, quantity of temperature sensors and number of heating events, and the estimated time frame to completion. There are also line items that would be applicable to each technology but are only used to estimate one technology. For example, injection management and injection well abandonment would be a common element for SER and ISCO, however only ISCO includes this line item. Treatment and disposal of extracted materials should also be included in the cost estimates. Generally, the level of detail should be consistent across each technology so an accurate cost comparison can be made.